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Research summary:

Current research focuses on the new physical phenomena that can arise when light interacts with nanomaterials. By designing, fabricating, and optically characterizing individual hybrid nanostructures, we have the potential to achieve unprecedented control over the flow of energy on the nanometer scale.

Selected recent publications:

M. Pelton, M. Liu, H. Y. Kim, P. Guyot-Sionnest, and N. F. Scherer, “Optical trapping and alignment of individual gold nanorods using plasmon resonances,” *Opt. Lett.* 31, 2075 (2006).

M. Pelton, M. Liu, S. Park, N. F. Scherer, and P. Guyot-Sionnest, “Ultrafast resonant optical scattering from single gold nanorods: Large nonlinearities and plasmon saturation,” *Phys. Rev. B* 73, 155419 (2006).

M. Pelton, K. Ladavac, and D.G. Grier, “Transport and fractionation in periodic potential-energy landscapes,” *Phys. Rev. E* 70, 031108 (2004).

M. Pelton, D.G. Grier, and P. Guyot-Sionnest, “Characterizing quantum-dot blinking using noise power spectra,” *Appl. Phys. Lett.* 85, 819 (2004).

M. Pelton, C. Santori, J. Vuckovic, B.-Y. Zhang, G. S. Solomon, J. Plant, and Y. Yamamoto, “Efficient source of single photons: A single quantum dot in a micropost microcavity,” *Phys. Rev. Lett.* 89, 233602 (2002). (Cover article)